

Multimedia Technology Integration Practice of Red Culture Education and Expansion of Significance of Civic and Political Education

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ABSTRACT

The emergence of multimedia technology has brought unprecedented changes to the education industry, and it is of practical significance to effectively utilize multimedia technology in red culture education. After analyzing the application of multimedia technology fusion in red culture education, the study takes 240 students in a university as the research object and uses questionnaire survey to explore the application level of multimedia technology in red culture. Subsequently, the influence factors of red culture education integrating multimedia technology on the expansion of ideological education were refined, and the interrelationship between the multimedia integration practice of red culture education and the expansion of ideological education was investigated through the multiple linear regression analysis to study the regression effect among the variables. More than 70% of the students believed that the red culture classroom applying multimedia technology had better interactive effect and learning effect, but the teachers' understanding of the However, teachers' use of multimedia technology and proficiency still need to be improved. The red culture education integrating multimedia technology has a significant effect on the goal of moral education, timeliness of education and playing the role of technology in the expansion of ideological and political education ($p < 0.001$), and the effect of the goal of moral education is the most obvious. The multimedia technology integration practice of red culture education has a promoting effect on the expansion of ideological and political education.

Keywords: questionnaire, multiple linear regression, influencing factors, multimedia technology, red culture education

1. Introduction

Red culture is an excellent culture formed during the revolutionary and construction period,

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containing rich cultural connotations and values, and always advancing with the times, constantly enriching and perfecting itself, is a valuable resource for ideological and political education [1-3]. In the new era, colleges and universities should strive to innovate forms and actively explore the realization path of red culture into ideological and political education, so that college students consciously accept the spiritual baptism of advanced culture [4-5].

Network ideological education is an important part of ideological education in colleges and universities, and the integration of red culture into network ideological education in colleges and universities can help to improve the relevance and effectiveness of ideological education [6-7], and enhance the sense of national identity and national pride of college students [8]. However, in the era of new media, the integration of network Civic and Political Education and red culture in colleges and universities has the problems of limited attention of red culture audience, imperfect construction of new media platform, and insufficient interactive communication of red culture [9]. The emergence of new media has brought new opportunities and challenges to civic and political education. It can become an important channel and platform for Civic and political education, spreading red culture, publicizing Civic and political theory, and realizing interactive communication with college students [10-11]. Therefore, it is crucial to explore the path of integrating red culture into the ideological and political education of college students in the new media era. Taking new media as a carrier, it can continuously promote the integration of red culture into the civic and political education, improve the educational effect and the quality of students' civic and political education, and further enhance the positive influence of red culture on the civic and political education of college students [12-13].

The integration of network ideological education and red culture in colleges and universities can enhance the ideological and political awareness of college students [14]. Through the short videos and microfilms on the network platform, students can understand and feel the rich connotation and noble spirit of red culture more intuitively, and inspire students' patriotic enthusiasm and sense of social responsibility [15]. At the same time, it can also provide a large number of high-quality red cultural education resources for the network political education in colleges and universities, and enrich the political teaching activities. Secondly, the integration of college network ideological education and red culture helps to improve students' humanistic literacy [16-17]. Red culture is an important part of traditional Chinese culture, and its integration into the network ideological education in colleges and universities can help students better understand and feel the profound heritage of Chinese culture [18].

This thesis explores the application of multimedia technology in red culture education from the three dimensions of basic material media, Internet technology and VR technology. Against this background, a questionnaire survey was conducted on 240 students in a university to analyze the situation of teachers' use of multimedia technology in red culture education, the impact of multimedia technology on classroom teaching, and students' overall perception of multimedia technology teaching, and to explore the level of application of multimedia technology in red culture education. Then we summarize the influence factors of red cultural education on the expansion of ideological education in terms of the goal of moral education, the timeliness of education and the role of playing technology. Combining with the collected data, we analyze the overall influence of red cultural education on the expansion of ideological education through descriptive statistics, and then we use multivariate linear quantitative analysis to obtain the regression effect among the variables, and we study the effect of the integration of multimedia technology in red cultural education on the expansion of ideological education. expansion.

2. Application of multimedia technology integration in red culture education

In recent years, the material medium of red culture education for college students has been constantly innovated, thanks to the development of information technology. The application of multimedia technology integration in red culture education is shown in Fig. 1, which can help red culture to convert

the original material form into informationized, data-based form of existence, so that the transmission and processing of the material medium of red culture has become more convenient, and the new material medium can also make the information related to the red culture to fully stimulate the senses of college students, and enhance the attractiveness of the red culture education to college students.

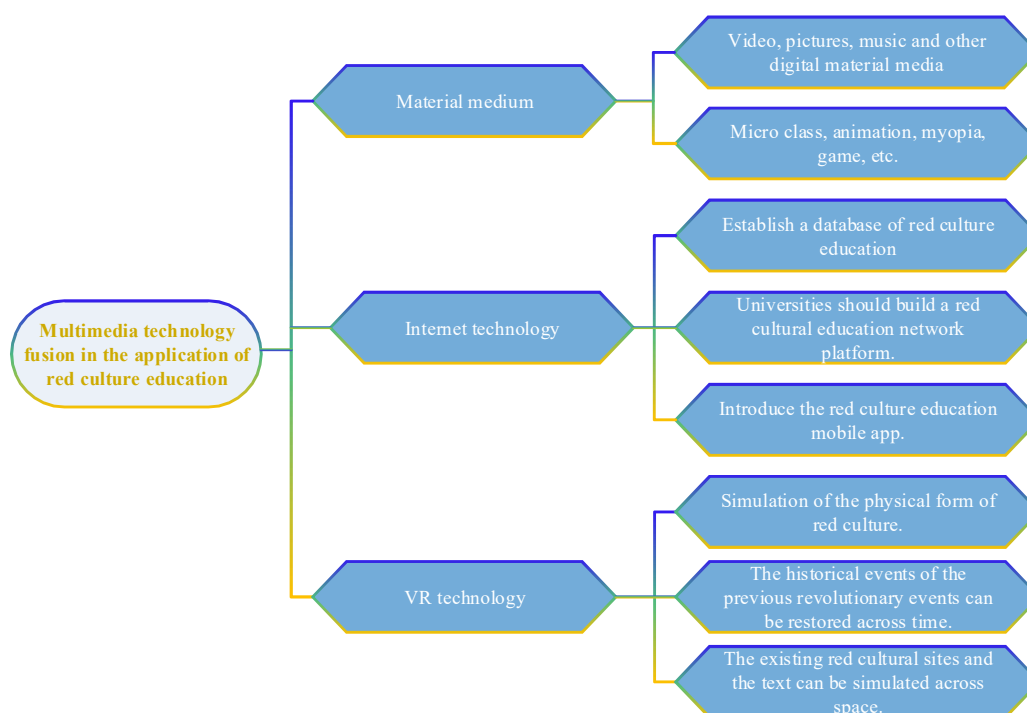


Fig. 1. Multimedia technology fusion in the application of red culture education

2.1. Application in the medium of basic substances

The material cultural forms of red culture are very rich, generally manifested in textual records, ruins, sculptures, cultural relics and so on. First of all, it should be transformed into the form of informationization and data that is easy to process and transmit, forming digital material media such as video, pictures, music and so on. But this is only for the initial processing of red culture, the formation of video, pictures, music and other digital media are the documentary of red culture, these digital red culture material media for today's college students do not have a strong attraction. Teachers need to compile and secondary process these videos, pictures, music, etc., and process them into the forms of material media that college students like, such as microclasses, animation, short videos, games, etc., to enhance their attractiveness.

2.2. Applications in Internet technology

Using Internet technology for red culture education, first of all, a database of red culture education should be established to integrate as much red culture as possible from all over the country, and finally, the government should create a red culture data base, so as to realize the sharing of red culture resources. Secondly, colleges and universities should build a red culture education network platform. For example, they should create a red culture theme public number, launch a red culture education program on the network platform, and invite famous scholars of red culture research to give live lectures on the network. Finally, colleges and universities should launch the red culture education mobile app, led by teachers, the use of red culture app into the use of college students' daily life and learning.

2.3. Application in VR technology

VR technology applied to the red culture education of college students can simulate the material form of red culture, can restore the scene of previous revolutionary historical events across time, and can simulate the existing red cultural sites and cultural relics across space. When college students use VR equipment, the data information collected by VR can simulate the material form of red culture, and these simulations can provide college students with strong visual and auditory stimulation, which can make college students feel immersed in the real world, and when college students interact with the simulated material form of red culture, it can also strengthen college students' impression on the information of red culture.

3. Level of application of multimedia technology in red culture education

In order to study the topic of the level of application of multimedia technology in red culture education, and to grasp the situation of the use of multimedia technology in red culture education, a multi-dimensional questionnaire survey was conducted among students.

3.1. Content and design of the survey

This paper surveyed 240 students in four classes in a university. The questionnaire was prepared from a number of dimensions such as students' overall evaluation of multimedia technology, teachers' use of multimedia, teachers' ability to utilize multimedia in teaching, teacher-student interaction and classroom atmosphere in the classroom, and students' attitudes and adaptability to teaching with multimedia technology, so as to make the data of this study reasonable and reliable.

A total of 240 questionnaires were distributed to the students of the sample universities. The total number of questionnaires recovered was 240, with a recovery rate of 100%, of which 228 were valid questionnaires, with an effective rate of 95%.

3.2. Teachers' use of multimedia technology

This section investigates the effects of the frequency of teachers' use of multimedia, teachers' ability to utilize it, and the level of production on the effectiveness of teaching in the red culture education classroom.

Teachers' use of multimedia technology is shown in Table 1. Regarding the frequency of use of multimedia equipment, 182 (75.84%) students chose the options sometimes used sometimes not used and only used during open class time. Twenty-eight (28.33%) of the students believed that the teachers were more skillful in using multimedia technology, but 122 (50.83%) of the students believed that the teachers were generally familiar and not too familiar with the ability to use multimedia technology. In terms of the level of teachers' production of multimedia resources, 55% of the students chose the options of average and not too good, and 21.67% of the students chose the option of not paying much attention to it, which indicates that more attention should be paid to the production of multimedia technology resources, and some rich content that attracts the students' eyes should be added on the basis of the content of the teaching and learning, so that teaching and learning effects can be improved.

Table 1. The use of multimedia technology in teachers

Usage frequency	Almost every class	Sometimes	Use in public class	No use
Number	58	118	64	0
Proportion (%)	24.17%	49.17%	26.67%	0.00%
Operational ability	Dexterity	General	Not so familiar	Unfamiliar
Number	68	62	60	50

Proportion (%)	28.33%	25.83%	25.00%	20.83%
Production level	Good	General	Not so good	Without concern
Number	56	75	57	52
Proportion (%)	23.33%	31.25%	23.75%	21.67%

3.3. Impact of multimedia technology on classroom teaching and learning

The influence of multimedia technology on the teaching of red culture education classroom makes to investigate from the following aspects, respectively, there are students adapting to the teaching progress, the attention of students when using multimedia, the interaction effect of teachers and students, and the aspect of learning effect.

The impact of multimedia technology on classroom teaching is shown in Table 2. In terms of the teaching progress of students' adaptation to multimedia technology teaching, 82.92% of the students chose to be very adaptable, and none of the students chose to be very adaptable. In terms of students' attention to lectures, 151 students chose to be very concentrated and relatively concentrated, accounting for 62.91%, and only a small number of students chose the option of inattention, which can also show that students have a strong adaptability to multimedia technology and can well use multimedia technology to learn red culture education classroom. 76.67% of the students thought that the interaction between teachers and students was very good, and 70% of the students thought that the learning effect was good, which proved that the red culture teaching integrated with multimedia technology could improve students' academic performance to a certain extent.

Table 2. The influence of multimedia technology on classroom teaching

Adaptive teaching schedule	Good	General	Discomfort	Very discomfort
Number	130	69	41	0
Proportion (%)	54.17%	28.75%	17.08%	0.00%
Lecture attention	Very concentrated	Comparably concentrated	No change	Unconcentrated
Number	68	83	52	37
Proportion (%)	28.33%	34.58%	21.67%	15.42%
Interaction effect	Very good	Good	General	Bad
Number	111	73	34	22
Proportion (%)	46.25%	30.42%	14.17%	9.17%
Learning effect	Very good	Good	General	Bad
Number	62	106	32	40
Proportion (%)	25.83%	44.17%	13.33%	16.67%

3.4. Overall impression of teaching with multimedia technology

This section includes three main aspects: the formal situation of the most exposed multimedia technology, the visual effect of multimedia lectures, and the evaluation of the multimedia technology red culture classroom.

Students' overall impression of teaching multimedia technology is shown in Table 3. For the form in which students were most exposed to multimedia technology, the majority of students chose text paired with supporting content, pictures, and videos, with the two items totaling 72.5%. For the visual effect of the lecture, 55% of the students chose very clear and clear, and only 23.33% chose unclear. For the overall evaluation of the multimedia technology red culture classroom, the number of those who chose very much and those who chose to like it accounted for 77.92% of the total number of students, and there were no students who chose not to like it, which indicates that the sample students

as a whole like to learn about red culture through multimedia technology.

Table 3. The overall impression of students on multimedia technology teaching

Technical form	Text and auxiliary content	Picture, video	Full screen text	High quality teaching video
Number	81	93	47	19
Proportion(%)	33.75%	38.75%	19.58%	7.92%
Visual effect	Very clear	Clear	Unclarity	Focus on content
Number	48	84	56	52
Proportion(%)	20.00%	35.00%	23.33%	21.67%
Classroom evaluation	Very like	Like	General	Dislike
Number	91	96	53	0
Proportion(%)	37.92%	40.00%	22.08%	0.00%

4. Expansion of ideological education by integrating multimedia education on red culture

4.1. Quantitative multivariate linear analysis

This paper adopts the method of multivariate linear quantitative analysis to analyze the expansion of the significance of the integration of multimedia technology in the red culture education for the civic education.

4.1.1. Multiple linear regression models. In quantitative analysis, a regression model in which there are more than two independent variables is called a multiple regression model, and the regression analysis performed on this model is called multiple regression analysis. Generally speaking, the dependent and independent variables obey the following relationship:

$$y = b_0 + b_1x_1 + b_2x_2 + \dots + b_nx_n + u \quad (1)$$

Then, after k observations of dependent variable y and independent variable $x_1x_2 \dots x_n$, k sets of observation samples $(y_t, x_{1t}, x_{2t} \dots x_{nt})$ are obtained, of which $t = 1, 2, 3 \dots k$. These k sets of observation samples will satisfy the following relationship:

$$y_t = b_0 + b_1x_{1t} + b_2x_{2t} + \dots + b_nx_{nt} + u_t \quad (2)$$

This relationship is the general form of a multiple linear regression model, where $(y_t, x_{1t}, x_{2t} \dots x_{nt}) t = 1, 2, 3 \dots k$ is the observed sample, $b_j (j = 0, 1, 2 \dots n)$ is the regression parameter, and u_t is the random error.

The regression coefficient $b_j (j = 0, 1, 2 \dots n)$ in the model represents the effect of the j th independent variable on the dependent variable when the other independent variables are held constant. This regression coefficient is called the partial regression coefficient.

The expectation function of y is:

$$E(y_t) = b_0 + b_1x_{1t} + b_2x_{2t} + \dots + b_nx_{nt} \quad (3)$$

Assuming that the value of the unknown parameter can be estimated by appropriate methods, replacing it with the unknown parameter of the overall regression function, the multiple linear regression equation for the sample can be obtained:

$$\hat{y}_t = \hat{b}_0 + \hat{b}_1x_{1t} + \hat{b}_2x_{2t} + \dots + \hat{b}_nx_{nt} \quad (4)$$

It is an estimate of the overall regression equation, where $\hat{b}_j (j = 0, 1, 2 \dots n)$ is an estimate of

$b_j (j = 0, 1, 2 \dots n)$.

The sample regression equation yields an estimate of the dependent variable $\hat{y}_i$ with a residual e_i usually with some error between it and the normal measurement y_i .

The multiple linear regression equation can be expressed using a matrix as:

$$\begin{pmatrix} y_1 \\ y_2 \\ \dots \\ y_n \end{pmatrix} = \begin{pmatrix} 1 & x_{11} & x_{21} & \dots & x_{n1} \\ 1 & x_{12} & x_{22} & \dots & x_{n2} \\ \dots & \dots & \dots & \dots & \dots \\ 1 & x_{1k} & x_{2k} & \dots & x_{nk} \end{pmatrix} \begin{pmatrix} b_0 \\ b_1 \\ \dots \\ b_k \end{pmatrix} + \begin{pmatrix} u_1 \\ u_2 \\ \dots \\ u_k \end{pmatrix} \quad (5)$$

where $Y = \begin{pmatrix} y_1 \\ y_2 \\ \dots \\ y_n \end{pmatrix}$ is the vector of observations of the dependent variable, $X = \begin{pmatrix} 1 & x_{11} & x_{21} & \dots & x_{n1} \\ 1 & x_{12} & x_{22} & \dots & x_{n2} \\ 1 & \dots & \dots & \dots & \dots \\ 1 & x_{1k} & x_{2k} & \dots & x_{nk} \end{pmatrix}$

is the matrix of observations of the independent variable, $B = \begin{pmatrix} b_0 \\ b_1 \\ \dots \\ b_k \end{pmatrix}$ is the vector of regression

parameters, and $U = \begin{pmatrix} u_1 \\ u_2 \\ \dots \\ u_k \end{pmatrix}$ is the vector of random errors.

The model can also be expressed as a matrix:

$$Y = XB + U \quad (6)$$

Similarly, the dependent variable expectation matrix can be expressed as:

$$E(Y) = XB \quad (7)$$

The matrix form of the regression equation for a multivariate linear sample can be expressed as:

$$\hat{Y} = X\hat{B} \quad (8)$$

4.1.2. Least squares estimation of parameters. The method of least squares, which is based on the principle that errors are not unduly concentrated on a few individual equations, is of great help in revealing a truer state of the system. The method of least squares is inextricably linked to multiple regression, and it is able to estimate the parameters of the system of equations easily and quickly, which is a great advantage in the field of error analysis. The specific procedure of estimating the parameters of multiple linear regression by the least squares method is described as follows:

Let $(y_t, x_{t1}, x_{t2} \dots x_{tn})$ be the t th observation sample, in order to minimize the sum of squares of errors, according to the principle of extreme value there are the following conditions:

$$\frac{\partial \sum(e_t^2)}{\partial b_j} = 0 (j = 0, 1, 2, \dots, n) \quad (9)$$

To wit:

goal of moral education, timeliness of education and playing a role in technology. The Cronbach's alpha coefficient for each factor was greater than 0.7 and the CITC for each item was greater than 0.5, so all of them were retained in the official questionnaire. The overall reliability of the questionnaire was 0.91, and the internal consistency of the questionnaire was high, which ensured the consistency, reproducibility, and stability of the questionnaire. The KMO value was 0.726, with good sampling adequacy and little bias correlation of the variables, and the Bartlett's Spherical Test value was 1106.186, and the degree of freedom, $df=223$, $p<0.001$, which ensured the structural validity of the questionnaire.

4.3. Overall Impact on the Expansion of Civic Education

In order to understand the overall impact of red cultural education integrating multimedia technology on the expansion of ideological education, the descriptive statistics of the questionnaire were analyzed, including the maximum value, minimum value, mean and standard deviation of each environmental dimension, and the descriptive statistics of each dimension are shown in Table 4. The highest average score is the goal of establishing morality, with a score of 3.87, and the scores of timeliness of education and playing the role of technology are the next highest, with 3.59 and 3.22 respectively, and the red culture education integrating multimedia technology has the greatest influence on the significance of Civic and Political education in terms of the goal of establishing morality.

Table 4. Descriptive statistics of each dimension

Dimension	Minimum value	Maximum value	Mean value	S.D.
The goal of cultivating character	1.00	5.00	3.87	0.81
The timeliness of education	1.00	5.00	3.59	0.83
Technical action	1.00	5.00	3.22	0.79

4.4. Regression Effects of Factors on the Expansion of Civic Education

4.4.1. The relationship between the goal of building moral character and the expansion of civic education. The regression effect of the Lidu Shupin goal dimension is shown in Table 5. Through regression analysis, the regression effect of the goal of establishing moral character and the expansion of Civic and Political Education reached a significant level in general, $R^2 = 0.683$, $P = 0.000 < 0.001$. Specifically, the red culture education is significant for the enhancement of Political Identity Literacy A1, Scientific Spirituality Literacy A2, Rule of Law Consciousness Literacy A3, and Public Participation Literacy A4 in Civic and Political Education ($P < 0.05$), with the most significant effect of Red Culture Education. Among them, the regression coefficient of political identity literacy A1 is 0.315, which has the most significant effect.

Table 5. The return effect of the goal of cultivating character dimension

Regression model	Partial regression coefficient		Normalized regression coefficient	T	P
	B	S.E.	Beta		
Constant	2.621	0.141		2.693	0.000
A1	0.185	0.034	0.315	1.778	0.002
A2	0.094	0.021	0.187	2.922	0.007
A3	0.127	0.036	0.292	1.149	0.009
A4	0.153	0.025	0.304	2.579	0.001

4.4.2. Relationship between Educational Timeliness and Civic Education Expansion. The regression effect of the dimensions of educational timeliness is shown in Table 6. Regression analysis with the three dimensions of educational timeliness as independent variables and expansion of Civic and Political Education as dependent variables shows that the regression effect of the dimensions of educational timeliness on the expansion of Civic and Political Education reaches a significant level ($R^2=0.635$, $P<0.05$.) Enrichment of Teaching Resources B1, Optimization of the Educational Environment B2, and Enhancement of the Quality of Teaching B3, with the regression coefficients of the three factors being 0.214, 0.156 and 0.183, among which enriching teaching resources B1 has the greatest influence on the expansion of ideological education.

Table 6. Regression effect of the time-effective dimension of education

Regression model	Partial regression coefficient		Normalized regression coefficient	T	P
	B	S.E.	Beta		
Constant	2.674	0.125		2.741	0.000
B1	1.773	0.134	0.214	1.843	0.024
B2	1.365	0.203	0.156	4.156	0.022
B3	1.642	0.274	0.183	2.966	0.005

4.4.3. The relationship between playing the role of technology and the expansion of Civic Education. The regression effect of the dimension of playing the role of technology is shown in Table 7. The overall regression effect of playing the role of technology for the expansion of civic and political education reaches a significant level, $R^2 = 0.671$, $P = 0.000 < 0.001$, which indicates that the model fit is high and the linear relationship between the dependent variable and the independent variable is significant, so the establishment of a linear model is reasonable. Specifically, innovation of red culture education carrier C1, expansion of red culture knowledge C2, and enrichment of red culture classroom organization C3 are all significant ($P < 0.05$) for the expansion of ideological education.

Table 7. The regression effect of the technical dimension

Regression model	Partial regression coefficient		Normalized regression coefficient	T	P
	B	S.E.	Beta		
Constant	1.539	0.216		3.180	0.000
C1	0.124	0.393	0.303	2.122	0.019
C2	0.105	0.114	0.285	3.027	0.012
C3	0.158	0.065	0.351	3.019	0.023

5. Conclusion

Through the combination of multimedia technology and red culture education, this paper explores its effect on the development of the education, and adopts the questionnaire survey and multivariate linear regression analysis to ensure the scientific nature of the research results. The results of the study are as follows:

- 1) Teachers are not frequent and proficient in the use of multimedia equipment in red culture education, and 55% of students think that their level of multimedia resource production is insufficient. 62.91% of the students paid more attention in the multimedia application classroom, and more than seventy percent of the students agreed that the interactive effect and learning effect of the multimedia technology red culture classroom were better. 77.92% of the students liked the use of multimedia technology in red culture education.
- 2) The integration of multimedia technology red culture education has a significant effect on the expansion of Civic and Political Education in terms of the goal of moral education, the timeliness of education and the role of playing the role of technology ($p < 0.001$), and at the same time, the factors of all dimensions also have a significant effect on the expansion of Civic and Political Education ($p < 0.05$).
- 3) The application of multimedia technology in red culture education can greatly improve the classroom capacity, realize effective and efficient classroom, establish a new type of teacher-student relationship, and create a harmonious learning atmosphere. At the same time, the integration of red culture education into the Civics course is not only conducive to the realization of the fundamental task of the Civics course of cultivating morality and nurturing people, but also to improve the effectiveness of Civics education and promote the development of high school Civics course, which is a long-term exploration process, and in the process, it will also encounter a lot of problems that need to be explored and solved.

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